

**AMENDMENTS TO THE CLAIMS**

1. (Currently Amended) A process for inhibiting misincorporation of a terminator in a single base primer extension reaction, comprising ~~the steps of:~~

providing a product of a nucleic acid synthesis reaction, the product comprising a nucleic acid template and a quantity of inorganic pyrophosphate;

incubating the product and an inorganic pyrophosphatase under conditions sufficient to decrease the quantity of pyrophosphate, to yield a purified reaction product;

combining the purified reaction product, a primer, a terminator having a detectable label, and a polymerase to form a mixture; and

incubating the mixture under conditions sufficient to extend the primer by addition of the terminator in a single base primer extension reaction, wherein decreasing the quantity of inorganic pyrophosphate in the product of a nucleic acid synthesis reaction inhibits pyrophosphorolysis in the single base primer extension reaction, so as to inhibit misincorporation of a terminator.

2. (Original) The process of claim 1 wherein the nucleic acid synthesis product further comprises a residual reaction component selected from the group consisting of: a residual primer and a nucleotide.

3. (Currently Amended) The process of claim 2 further comprising ~~the steps of:~~

adding an enzyme selected from the group consisting of: an exonuclease, an alkaline phosphatase, and a combination thereof to the nucleic acid synthesis product; and

incubating the nucleic acid synthesis product and enzyme under conditions sufficient to degrade the residual reaction component.

4. (Currently Amended) The process of claim 2 further comprising ~~the steps of~~:  
adding an enzyme selected from the group consisting of: an exonuclease, an alkaline phosphatase, and a combination thereof to the purified reaction product; and  
incubating the nucleic acid synthesis product and enzyme under conditions sufficient to degrade the residual reaction component.

5. (Currently Amended) The process of claim 3 or 4 further comprising ~~the step of~~:  
inactivating the enzyme.

6. (Currently Amended) The process of claim 1 further comprising ~~the step of~~  
inactivating the inorganic pyrophosphatase.

7. (Original) The process of claim 1 wherein the detectable label is a fluorescent label.

8. (Canceled)

9. (Currently Amended) The process of claim 1 further comprising ~~the step of~~  
detecting the detectable label.

10. (Original) The process of 9 wherein the step of detecting the label comprises detection of fluorescence polarization.

11-12 (Canceled)

13. (Currently Amended) The process of claim 3 or 4 wherein the alkaline phosphatase is selected from the group consisting of: bacterial alkaline phosphatase, calf intestinal alkaline phosphatase and a combination thereof.

14. (Currently Amended) The process of claim 3 or 4 wherein the alkaline phosphatase is shrimp alkaline phosphatase.

15. (Currently Amended) The process of claim 3 or 4 wherein the exonuclease is selected from the group consisting of: lambda exonuclease, mung bean exonuclease, Bal31 exonuclease, T7 exonuclease and a combination thereof.

16. (Currently Amended) The process of claim 3 or 4 wherein the exonuclease is exonuclease I.

17. (Canceled)

18. (Original) The process of claim 1 wherein the polymerase is a thermostable polymerase having a greater affinity for an acyclo nucleoside terminator than for a dideoxyterminator.

19-20 (Canceled)

21. (Original) The process of claim 1 wherein the steps are performed in a single reaction container.

22. (Canceled)

23. (Original) The process of claim 1 wherein the terminator is an acyclo nucleoside terminator.

24. (Currently Amended) The process of claim [[1]] 23 wherein the acyclo nucleoside terminator comprises a detectable label.

25. (Canceled)

26. (Currently Amended) A process for inhibiting misincorporation of a terminator in a single base primer extension reaction, comprising ~~the steps of:~~

providing a product of a nucleic acid synthesis reaction, the product comprising a nucleic acid template and a quantity of inorganic pyrophosphate;

incubating the product and a pyrophosphate removing enzyme under conditions sufficient to decrease the quantity of pyrophosphate, to yield a purified reaction product;

combining the purified reaction product, a primer, a terminator having a detectable label, and a polymerase to form a mixture; and

incubating the mixture under conditions sufficient to extend the primer by addition of the terminator in a single base primer extension reaction, wherein decreasing the quantity of inorganic pyrophosphate in the product of a nucleic acid synthesis reaction inhibits pyrophosphorolysis in the single base primer extension reaction, so as to inhibit misincorporation of a terminator.

27. (Original) The process of claim 26 wherein the nucleic acid synthesis product further comprises a residual reaction component selected from the group consisting of: a residual primer and a nucleotide.

28. (Currently Amended) The process of claim 27 further comprising ~~the steps of:~~  
adding an enzyme selected from the group consisting of: an exonuclease, an alkaline phosphatase, and a combination thereof to the nucleic acid synthesis product; and  
incubating the nucleic acid synthesis product and enzyme under conditions sufficient to degrade the residual reaction component.

29. (Currently Amended) The process of claim 27 further comprising ~~the steps of:~~  
adding an enzyme selected from the group consisting of: an exonuclease, an alkaline phosphatase, and a combination thereof to the purified reaction product; and

incubating the nucleic acid synthesis product and enzyme under conditions sufficient to degrade the residual reaction component.

30. (Currently Amended) The process of claim 26 further comprising ~~the step of~~ inactivating the inorganic pyrophosphatase.

31. (Canceled)

32. (Currently Amended) A process for inhibiting misincorporation of a terminator in a single base primer extension reaction, comprising ~~the steps of:~~

combining a nucleic acid template, a primer, an inorganic pyrophosphatase, an acyclo nucleoside terminator, and a polymerase to yield a mixture substantially free of deoxynucleotide-triphosphates; and

incubating the mixture under conditions sufficient to extend the primer by addition of the acyclo nucleoside terminator, wherein the pyrophosphatase inhibits pyrophosphorylation in the single base primer extension reaction, thereby reducing misincorporation of a terminator.

33-63 (Canceled)